

direct elongation of the internal coat, like the spores of the Zygnemaceæ formed through conjugation, while the spores of *Bulbochæte*, and perhaps the spores of the Desmidiæ, likewise originating through conjugation, behave in the same way as those of *Sphæroplea*. This induces us to regard the latter fact as a peculiar form of the 'alternation of generations,' if we denominate the 'swarming-cells' produced from the spores of *Bulbochæte* and *Sphæroplea* an asexual generation, which by metamorphosis is converted at once into the *Closterium*-like germ, then by asexual division produces the sexual cells, till the cycle is concluded by the formation of the impregnated spores.

X.—*New Terrestrial Shells from Ceylon, with a General List of the Species inhabiting that Island.* By W. H. BENSON, Esq.

Cyclophorus Parma, nobis, n. s.

Testa latissime umbilicata, planato-depressa, discoidea, tenuiuscula, confertim et arcuatim sericato-striata, saturate castanea, flammulis nonnullis pallidis spiram versus ornata, subtus interdum pallidiori; spira planata, apice nullo modo prominente, sutura profunda; anfractibus 5 convexis, ultimo antice descendente; apertura valde obliqua, ampla, ovato-rotundata, superne angulata, intus livide cærulea; peristomate duplici, interiori continuo, albido, ad dextram expansiusculo, exteriori breviter interrupto, expansiusculo, fusco-corneo; margine columellari subtus recedente, dextro prorsum arcuato; umbilico latissimo, minime profundo. Operculo tenui, corneo, $5\frac{1}{2}$ -spirato, suturis intus extusque pulchre carinatis.

Diam. major 26, minor 23, alt. 6 mill.

Hab. in regione montana Insulæ Ceylon. Mus. E. L. Layard.

There are two specimens in the cabinet of Mr. Edgar Layard. The shell is easily distinguished from the other planorbular *Cyclophori* of Ceylon by its dark colour and depressed form, which recall those of *Pterocyclos hispidus*, Pearson, by its very wide and shallow umbilicus, and by the size and peculiar position of the aperture. The whorls of the operculum, which is of a clear horn-colour, are less closely wound than in *C. Cratera*.

Cyclophorus Cratera, nobis, n. s. *Paralyse 1954*

Testa late umbilicata, planulato-depressa, subdiscoidea, tenuiuscula, radiatim et confertim ruguloso-striata, vix nitidula, fulvo-cornea, raro castaneo-strigata; spira planulata, apice vix prominente, sutura profundiuscula; anfractibus 5 convexiusculis, ultimo longe lenteque descendente; apertura obliqua mediocri, subrotundata, superne angulata, intus albida; peristomate duplici, interiori continuo, acuto, breviter porrecto, exteriori expansiusculo, breviter adnato, albido; umbilico aperto, profundiusculo. Operculo tenui,

corneo, 7-spirato; anfractibus valde angustis, suturis intus et extus pulchre carinatis.

	Diam. major	24	..	minor	20	..	alt.	8
	"	"		"	18		"	6
	"	"		"	11		"	4

Hab. in Insula Ceylon.

There are five good specimens in the cabinet of Mr. Edgar Layard, of which the largest only has irregular streaks on the upper side. I find a single dead and bleached specimen among some Cingalese shells received from Mr. Frederick Layard. The operculum is more closely wound than in *C. Parma*, from which it differs in colour, the form and position of the aperture, sculpture, and deeper umbilicus; this part is shallower than in its near ally, *C. annulatus*, Trosch., which exhibits, moreover, a prominent dark apex to the spire, whereas in *C. Cratera* the apex is flattened and white. The variation in size is considerable, as may be seen by reference to the measurements. The smallest variety exhibits the adult character: the narrow volutions of the operculum, and a darker corneous hue than in *C. Parma*, are constant. Its double peristome and the flatness of the apex at once distinguish it from *C. Thwaitesi*, Pfr. Of three specimens of *C. Bairdii*, Pfr., contained in Mr. E. Layard's cabinet, two specimens, well variegated with chestnut, show no indication of a keel, while a pallid variety exhibits it distinctly.

Leptopoma apicatum, nobis, n. s.

Testa subobtecte perforata, globoso-conica, tenui, oblique striatula, sublente spiraliter confertim striata, albida, interdum flammulis et fascia unica infra periphæriam angulatam ornata, sutura profunda; spira conica, apice saturate castaneo-nigrescente, acutiusculo; anfractibus $4\frac{1}{2}$ convexiusculis, ultimo ad periphæriam obtuse angulato; apertura obliqua, rotundata; peristomate duplici, interiori expansiusculo marginibus callo junctis, exteriori breviter expanso; margine columellari reflexo perforationem fere occultante.

Diam. major $10\frac{1}{2}$, min. 9, axis 9 mill.

Hab. in Insula Ceylon (ad portas Curuwitty dictas provinciæ Suf-fragam?).

This *Leptopoma* may be distinguished from any of the varieties of *L. vitreum* by its angular periphery, dark apex, more convex whorls, deeper suture, double peristome and parietal callus, as well as by the reflexion of the columellar lip over the perforation, and of the narrow lip above it. It is deficient also in the angular projection observable on the lower part of the same lip in that species. The label which accompanies the three specimens in Mr. E. Layard's collection gives only the general habitat as Ceylon; but Mr. Layard's remarks on a small *Cyclostoma*, $4\frac{1}{2}$ lines in height and diameter, and pre-

senting a closed umbilicus and black apex, contained in his 'Rambles in the Island,' leave little room for doubting that this is the species found by Mr. C. P. Layard in the Curuwitty Pass, with another scarcer species which I have not yet seen.

Bulimus fuscoventris, nobis, n. s.

Testa anguste rimato-perforata, ovato-conica, tenui, irregulariter puncticulata? striatula, albida, nitidula, fasciis tribus rufo-castaneis evanescentibus, basali latissima, picta; spira conica, apice obtuso, sutura impressa; anfractibus 5 convexiusculis, ultimo $\frac{4}{5}$ testæ æquante, ventricosiusculo; apertura obliqua, ovata; peristomate tenui, undique breviter expanso, marginibus remotis callo tenui rufo-castaneo junctis, columellari rimam obtegente, intus calloso ascendente.

Long. 25, diam. 13, apert. 12 longa, $9\frac{1}{2}$ mill. lata.

Hab. in Insula Ceylon. Teste F. Layard.

This shell is not in good condition, and the surface and colour may be somewhat different in perfect specimens. It has some affinity to *Bulimus Bontiaë*, but the last whorl is less ventricose, and the spire and aperture narrower.

Bulimus rufopictus, nobis, n. s. *Parvate 1954*

Testa anguste perforata, ovato-pyramidata, oblique striatula, albida, strigis rufis interruptis fulguratis, fasciisque tribus saturatoribus, mediana basaliq̄ue angustis, submediana latiori, picta; spira elongato-conica, apice obtuso, sutura impressa; anfractibus 5 convexiusculis, ultimo $\frac{3}{4}$ testæ vix æquante, basi convexa; apertura obliqua, rotundato-ovali; peristomate tenui, acuto, expansiusculo, marginibus remotiusculis callo tenui junctis, columellari superne latiori, perforationem obtegente, dextro valde arcuato.

Long. 20, diam. $11\frac{1}{2}$, apert. 9 longa, $7\frac{1}{2}$ mill. lata.

Hab. in Insula Ceylon. Teste F. Layard.

Achatina parabilis, nobis, n. s.

Testa oblongo-ovata, solidiuscula, nitida, rugose striata, striis minutissimis obsoletis spiralibus decussata, sub epidermide luteo-cornea albida; spira elongato-conica, apice obtuso, sutura leviter impressa, suberenulata; anfractibus 6, subplanulatis, ultimo convexiusculo, $\frac{3}{4}$ testæ vix æquante; apertura triangulari semiovata, intus albida; peristomate leviter inflexo, marginibus callo tenui junctis, dextro sinuato, obtusiusculo, columellari perarcuato, oblique valde truncato.

Long. 20, diam. 10, long. apert. 9, lat. 5 mill.

Hab. in Insula Ceylon. Teste F. Layard.

Helix Galerus, nobis, n. s.

Testa umbilicata, subconoideo-depressa, lenticulari, pallide cornea, confertissime oblique striata, striis spiralibus exiguis decussata; spira depresso conoidea, sutura impressa, apice obtusiusculo; an-

fractibus 5 lente accrescentibus, convexiusculis, ultimo antice majori, non descendente, periphæria acute carinata, marginata, subtus convexiusculo, margine periomphali obtuse angulato; umbilico profundo, subanguste perspectivo; apertura subsecuriformi; peristomate acuto, marginibus distantibus, columellari brevi, superne reflexiusculo.

Diam. major 9, minor 8, axis 4 mill.

Hab. ad Rågama, Ceylon. Coll. E. L. Layard.

5th June 1856.

CINGALESE LAND SHELLS.

- | | |
|---|---|
| Vitrina irradians, <i>Pfr.</i> | Helix Thwaitesi, <i>Pfr.</i> |
| — Edgariana, <i>Bens.</i> | — subopaca, <i>Pfr.</i> |
| — membranacea, <i>Bens.</i> | — nepos, <i>Pfr.</i> |
| Succinea Ceylanica, <i>Pfr.</i> | — subconoidea, <i>Pfr.</i> |
| Helix Waltoni, <i>Reeve.</i> | — convexiuscula, <i>Pfr.</i> |
| — Skinneri, <i>Reeve.</i> | — carneola, <i>Pfr.</i> |
| — Juliana, <i>Gray.</i> | — Corylus, <i>Reeve.</i> |
| — Ganoma, <i>Pfr.</i> | — umbrina, <i>Reeve.</i> |
| — Chenui, <i>Pfr.</i> | — Rivolii, <i>Fér.</i> |
| — semidecussata, <i>Pfr.</i> | — erronea, <i>Pfr.</i> |
| — hæmastoma; also in Nicobars. | — Charpentieri, <i>Pfr.</i> |
| — Phoenix, <i>Pfr.</i> Melanotrachus | — fallaciosa, <i>F.</i> ; also in S. India. |
| contains vars. of this and the last, | — Galerus, <i>Bens.</i> |
| and is set aside by Pfeiffer. | Streptaxis Layardiana, <i>Bens.</i> |
| — superba, <i>Pfr.</i> | — Cingalensis, <i>Bens.</i> |
| — Tranquebarica, also in South | Pupa muscerda, <i>Bens.</i> |
| India. | — mimula, <i>Bens.</i> |
| — bistrialis, <i>Beck</i> ; also in South | — Ceylanica, <i>Pfr.</i> (Ennea). |
| India. | Bulimus 3-fasciatus, <i>Brug.</i> |
| — Ceylanica, <i>Pfr.</i> | — Ceylanicus, <i>Pfr.</i> |
| — Gardneri, <i>Pfr.</i> | — albizonatus, <i>Reeve.</i> |
| — coriaria, <i>Pfr.</i> | — adumbratus, <i>Pfr.</i> |
| — vittata, <i>Müll.</i> | — intermedius, <i>Pfr.</i> |
| — Layardi, <i>Pfr.</i> | — punctatus, <i>Anton</i> ; Bundel- |
| — ceraria, <i>Bens.</i> | khund and South India. |
| — concavospira, <i>Pfr.</i> | — Mavortius, <i>Reeve.</i> |
| — novella, <i>Pfr.</i> | — pullus, <i>Gr.</i> =insularis; North |
| — verrucula, <i>Pfr.</i> | India. |
| — hyphasma, <i>Pfr.</i> | — Panos, <i>Bens.</i> |
| — Emiliana, <i>Pfr.</i> | — proletarius, <i>Pfr.</i> |
| — Woodiana, <i>Pfr.</i> | — gracilis, <i>Hutton</i> ; and North |
| — puteolus, <i>Bens.</i> =clathratula, | India. |
| <i>Pfr.</i> ? | — fuscoventris, <i>Bens.</i> |
| — mononema, <i>Bens.</i> | — rufopictus, <i>Bens.</i> |
| — marcida, <i>Bens.</i> | Achatina nitens, <i>Gray.</i> |
| — partita, <i>Pfr.</i> | — Ceylanica, <i>Pfr.</i> ; and Nil- |
| — vilipensa, <i>Bens.</i> ; apparently | gherries. |
| also in Nilgherries. | — punctogallana, <i>Pfr.</i> |
| — perfucata, <i>Bens.</i> | — inornata, <i>Pfr.</i> |
| — biciliata, <i>Pfr.</i> | — pachycheila, <i>Bens.</i> |
| — Isabellina, <i>Pfr.</i> | — capillacea, <i>Pfr.</i> |
| — trifilosa, <i>Pfr.</i> | — veruina, <i>Bens.</i> |
| — politissima, <i>Pfr.</i> | — parabilis, <i>Bens.</i> |

Cyclostomacea.

Cyclophorus Ceylanicus, Sow.	Aulopoma helicinum.
— Menckanus, Ph.	— Hoffmeisteri, Trosch., distinct.
— Involvlus, Müll., var.	— grande, Pfr.
— alabastrinus, Pfr.	Cataulus Templemani, Pfr.
— punctatus, Grat.	— Layardi, Gray.
— Bairdi, Pfr.	— Eurytrema, Pfr.
— Thwaitesi, Pfr.	— pyramidatus, Pfr.
— annulatus, Trosch.	— Thwaitesi, Pfr.
— loxostoma, Pfr.	— Austenianus, Bens.
— parapsis, Bens.	— decorus, Bens.
— Parma, Bens.	— marginatus, Pfr.
— Cratera, Bens.	— duplicatus, Pfr.
Leptopoma halophilum, Bens.	— aureus, Pfr.
— orophilum, Bens.	Cyclostomus? gradatus, Pfr.
— flammeum, Pfr.	Pterocyclos rupestris, Bens., var. picta,
— conulus, Pfr.	Trosch.
— semiclausum, Pfr.	— Cumingi, Pfr.
— pœcilum, Pfr.	— Cingalensis, Bens.
— elatum, Pfr.	— Troscheli, Bens.
— apicatum, Bens.	— bifrons, Pfr.
Aulopoma Itieri, Grat.	

[117 Land Shells.]

Note.—*Cyclophorus stenostoma*, Sow. and *Pterocyclos bilabiatius*, Sow., have lately been sent to me as from Ceylon, without any definite locality. They are both Nilgherry shells, and I consider their Cingalese habitat so doubtful, that I have not introduced them in my list.

The *Vitrinæ* of Ceylon have an Indian aspect. A membranaceous species also occurs in South India.

The most characteristic form of *Helix* is that of *H. Waltoni* and *Skinneri*.

A considerable number of Cingalese *Helices* are of the vitrini-form type, well represented in the Nilgherries by small species, and by larger forms even to a considerable height in the Himalaya, and throughout Hindostan.

Several species are common to Hindostan (especially the Peninsula) and Ceylon.

The group, *H. Rivolii*, *erronea*, and *Charpentieri*, is represented, on the east side of the Bay of Bengal, by *H. refuga*, Gould, and *Achatina*, Gray.

The *Streptaxes* are nearly allied to the Nilgherry species.

Pupa Ceylanica is closely allied to the North Indian *P. bicolor*, Hutton, both belonging to the type *Ennea*, Ad.

Some of the *Bulimi* are Indian in type, others approach the Philippine forms.

The *Achatinæ* are of a type well represented in the Nilgherries, and to which belong species from the Mahabaleshwur hills, Bombay, Central India, Lower Bengal, Sikkim, and the Khasya range.

The *Cyclophori* are of Indian types. *Leptopoma* represents forms of the Indian Archipelago.

Aulopoma is probably altogether, and *Cataulus* is nearly confined to Ceylon, a species occurring in the Nicobar Isles.

Pterocyclos is an Indian type.

November 24th, 1855.

XI.—Notice of a curious Metamorphosis in a Polype-like Animal.

By C. W. PEACH, Member of the Royal Physical Society of Edinburgh*.

[With a Plate.]

IN March of the present year, I obtained from a fisherman's line an old and deeply corroded valve of *Psammobia ferroensis*, hooked up from deep water. On it I observed some minute jelly-like spots, and on placing it in a shallow glass of sea-water and examining it next day with my pocket-lens, I fancied I could make them out to be Polype-like animals. I accordingly transferred the shell, in a watch-glass filled with sea-water, to my microscope, and was delighted to find my suspicions correct, for, after a little management so as to catch the light, I could see the forms as figured at A (Pl. VIII.), attached to the shell by short footstalks; they were a little inflated near the upper part, and tipped with a slightly raised and rounded centre, from which extended four long and four short leaf-like arms, each granulated down the centre. One or two had springing from these, delicate tentacle-like arms, as seen at A, *a*—probably in a farther state of development. They were easily disturbed, but soon again displayed themselves, and their transparency, added to this shyness, rendered it difficult to catch their forms. At first I thought they were the early stage of an *Hydractinia*, and probably *H. brevicornis* of Müller, mentioned in Johnston's second edition of the 'British Zoophytes,' p. 35.

My next examination was on the 2nd of April, after giving them a supply of sea-water; they were still fixed; I could however perceive a difference—the centre of the head was more raised and conical, and the arms shorter. I examined them daily, and on the 6th, instead of moored creatures, I had a fleet of probably more than 100 minute *free naked-eyed medusoid* beauties jerking about in all directions. Except in size they were all alike, and perfectly transparent; the umbrella was well rounded and pilose; the subumbrella large; each had four large ocellus-like bulbs, composed of minute dark granules on the edge of the mantle,

* Communicated by the Author, having been read at the Annual Meeting of the Royal Institution of Cornwall, Nov. 1855.